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April 1, 2011

Ms. Jill Linn  
Williston Basin Interstate Pipeline Company  
P.O. Box 131  
Glendive, MT 59330

Dear Ms. Linn:

The Department of Environmental Quality (Department) has made its decision on the Montana Air Quality Permit application for addition of two compressor engines to Williston Basin Interstate Pipeline Company's Monarch Compressor Station. The application was given permit number 2901-03. The Department's decision may be appealed to the Board of Environmental Review (Board). A request for hearing must be filed by April 25, 2011. This permit shall become final on April 18, 2011, unless the Board orders a stay on the permit.

Procedures for Appeal: Any person jointly or severally adversely affected by the final action may request a hearing before the Board. Any appeal must be filed before the final date stated above. The request for a hearing shall contain an affidavit setting forth the grounds for the request. Any hearing will be held under the provisions of the Montana Administrative Procedures Act. Submit requests for a hearing in triplicate to: Chairman, Board of Environmental Review, P.O. Box 200901, Helena, Montana 59620.

Conditions: See attached.

For the Department,

Vickie Walsh  
Air Permitting Program Supervisor  
Air Resources Management Bureau  
(406) 444-9741

Shawn Juers  
Environmental Engineer  
Air Resources Management Bureau  
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VW:SJ  
Enclosure

## MONTANA AIR QUALITY PERMIT

Issued To: Williston Basin Interstate  
Pipeline Company  
P.O. Box 131  
Glendive, MT 59330

MAQP: #2801-03  
Application Complete: 2/15/2011  
Preliminary Determination Issued: 3/1/2011  
Department's Decision Issued: 4/1/2011  
Permit Final:  
AFS #:025-0008

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Williston Basin Interstate Pipeline Company (WBI), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

### SECTION I: Permitted Facilities

#### A. Plant Location

WBI owns and operates a natural gas compressor station located in the Northeast ¼ of Section 36, Township 9 North, Range 58 East, Fallon County, Montana. The facility is known as the Monarch Compressor Station. The list of permitted equipment can be found in Section I of the permit analysis.

#### B. Current Permit Action

On January 10, 2011, the Department of Environmental Quality (Department) received an application for a modification to add two (2), 2,370 brake horsepower (bhp) 4-stroke lean-burn compressor engines equipped with oxidation catalyst. An affidavit of public notice was received on February 1, 2011, and final correspondence completing the application on February 15, 2011. The current action permits the proposed changes, and updates the format and rule references of the permit to reflect that currently used by the Department.

### SECTION II: Conditions and Limitations

#### A. Emission Limitations

1. WBI shall properly operate and maintain the two (2) 2,370-bhp compressor engines and associated control equipment. The engines shall be of a 4-stroke lean-burn engine class and shall be equipped with oxidation catalyst (ARM 17.8.749, ARM 17.8.752).
2. The pound per hour (lb/hr) emission limits for each 2,370-bhp compressor engine (Unit #3 and Unit #4) shall be determined using the following equation and pollutant specific grams per brake horsepower-hour (g/bhp-hr) emission factors (ARM 17.8.749, ARM 17.8.752):

#### Equation:

Emission Limit (lb/hr) = Emission Factor (g/bhp-hr) \* maximum rated design capacity of engine (bhp) \* 0.002205 lb/g

Emission Factors:

Oxides of Nitrogen (NO<sub>x</sub>): 0.50 g/bhp-hr  
Carbon Monoxide (CO): 0.20 g/bhp-hr  
Volatile Organic Compounds (VOC): 0.32 g/bhp-hr

3. Emissions from each of the 2,000 horsepower (hp) Superior 12SGTB compressor engines (Unit #1 and Unit #2) shall not exceed the following (ARM 17.8.749, ARM 17.8.752):

NO <sub>x</sub> <sup>1</sup>	8.80 lb/hr
CO	10.00 lb/hr
VOC	4.40 lb/hr

4. The hours of operation of each 2,000-hp Superior 12SGTB compressor engine shall not exceed 8,000 hours of operation per rolling 12-month time period (ARM 17.8.749, ARM 17.8.1204).

5. Emissions from the 248-hp Waukesha F1197G emergency generator engine shall not exceed the following (ARM 17.8.749, ARM 17.8.752):

NO <sub>x</sub>	10.91 lb/hr
CO	0.55 lb/hr
VOC	0.55 lb/hr

6. WBI shall operate the 248-hp Waukesha F1197G generator engine in a backup or emergency capacity only, except for engine maintenance related operations (ARM 17.8.749).
7. WBI shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources or stacks installed or modified after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).
8. WBI shall not cause or authorize the use of any street, road, or parking area without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).
9. WBI shall treat all unpaved portions of the access roads, parking lots, and general plant area with water and/or chemical dust suppressant, as necessary, to maintain compliance with the reasonable precautions limitation in Section II.A.8 (ARM 17.8.749).
10. WBI shall operate all equipment to provide the maximum air pollution control for which it was designed (ARM 17.8.752).
11. WBI shall comply with all applicable standards and limitations, monitoring, reporting, recordkeeping, and notification requirements contained in 40 CFR 60, Subpart JJJJ and 40 CFR 63, Subpart ZZZZ (ARM 17.8.340 and 40 CFR 60, Subpart JJJJ, and ARM 17.8.342 and 40 CFR 63, Subpart ZZZZ).

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<sup>1</sup> NO<sub>x</sub> reported as NO<sub>2</sub>.

## B. Testing Requirements

1. Each 2,370-bhp compressor engine shall be tested for NO<sub>x</sub> and CO, concurrently, within 180 days of the initial start-up date of each compressor engine (ARM 17.8.105 and ARM 17.8.749).
2. Each (all four) compressor engines shall be tested for NO<sub>x</sub> and CO, concurrently, on an every 4-year basis, or according to another testing/monitoring schedule as may be approved in writing by the Department (ARM 17.8.105 and ARM 17.8.749).
3. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
4. The Department may require further testing, including testing of other emitting units (ARM 17.8.105).

## C. Operational Recordkeeping and Reporting Requirements

1. WBI shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on estimated actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. WBI shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include *the addition of a new emissions unit*, change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).
3. WBI shall document, by month, the hours of operation of each 2,000-bhp compressor engine. By the 25<sup>th</sup> day of each month, WBI shall total the hours of operation for the previous month, and calculate the rolling 12-month sum. The monthly information will be used to verify compliance with the rolling 12-month limitation of Section II.A.4. The monthly information shall be submitted to the Department upon request, and shall be submitted along with the annual emissions inventory.
4. WBI shall annually certify that its emissions are less than those that would require the facility to obtain an air quality operating permit as required by ARM 17.8.1204(3)(b). The annual certification shall comply with the certification requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emissions inventory information (ARM 17.8.749 and ARM 17.8.1204).

5. All records compiled in accordance with this permit must be maintained by WBI as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

D. Notification

1. WBI shall provide the Department with written notification of commencement of installation of each of the 2,370-bhp compressor engines, postmarked within 30 days of the commencement of construction (ARM 17.8.749).
2. WBI shall provide the Department with written notification of the actual startup date of each 2,370-bhp compressor engine postmarked within 15 days after the actual start-up date (ARM 17.8.749).

SECTION III: General Conditions

- A. Inspection – WBI shall allow the Department’s representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (continuous emissions monitoring system (CEMS), continuous emissions rate monitoring system (CERMS)) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if WBI fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving WBI of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefor, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the MAQP shall be made available for inspection by the Department at the location of the source.

- G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by WBI may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Montana Air Quality Permit (MAQP) Analysis  
Williston Basin Interstate Pipeline Company  
Monarch Compressor Station  
MAQP #2801-03

I. Introduction/Process Description

Williston Basin Interstate Pipeline Company (WBI) owns and operates a natural gas compressor station. The facility is located in the Northeast ¼ of Section 36, Township 9 North, Range 58 East, Fallon County, Montana, and is known as the Monarch Compressor Station.

A. Permitted Equipment

WBI's Monarch compressor station includes, but is not limited to, the following equipment:

Source ID #	Source
EU #1	2000-bhp 4-stroke 'Clean-Burn' Compressor Engine (Superior 12SGTB)
EU #2	2000-bhp 4-stroke 'Clean-Burn' Compressor Engine (Superior 12SGTB)
EU #3	2370-bhp 4-stroke Lean-Burn compressor engine w/ oxidation catalyst (CAT 3608 LE)
EU #4	2370-bhp 4-stroke Lean-Burn compressor engine w/ oxidation catalyst (CAT 3608 LE)
EU #5	248-bhp Emergency Generator (Waukesha F1197G)
EU #6	TEG Dehydration Unit Still Vent
IEU #1a	Tri-ethylene Glycol (TEG) Dehydration Unit Reboiler - 1.5 MMBtu/hr
IEU #1b	Flash Tank (to atmosphere)
IEU #2	2.47 MMBtu/hr Boiler (Weil Mclein Boiler)
IEU #3	0.063 MMBtu/hr Water Heater (A.O. Smith)
IEU #4	0.075 MMBtu/hr Space Heater (Gordon Ray)
IEU #5	0.075 MMBtu/hr Space Heater (Gordon Ray)

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bhp = brake horsepower  
EU = Emitting Unit  
hr = hour  
IEU = Insignificant Emitting Unit  
MMBtu = million British Thermal Units

## B. Source Description

The complex has several purposes. The first is to pump the field gas up to the required pressure in the natural gas transmission system. Compression of the gas is accomplished using the compressor engines described above. Three heaters provide heat to the various station facilities.

The second purpose of the complex is to "dry" the gas. The gas contains some moisture, which must be removed from the system prior to being sent into the transmission system. This is accomplished with a tri-ethylene glycol dehydrator.

The gas is treated with a tri-ethylene glycol solution, which absorbs the water in the gas stream. The glycol solution is then heated to about 300 degrees Fahrenheit (°F) to drive off the water and return the glycol. The heat necessary for this activity is generated by burning natural gas in the dehydrator reboiler.

## C. Permit History

On November 7, 1993, WBI submitted a permit application to operate two, 2000-bhp Superior 12 SGTB compressor engines and associated equipment at a compressor station in Fallon County. **MAQP #2801-00** was issued on March 15, 1994.

**MAQP #2801-01** was issued in response to a modification request from WBI. WBI requested that the carbon monoxide (CO) emission limit for the two, 2000-bhp Superior 12SGTB compressor engines be reduced from 13.2 pounds per hour to 10.0 pounds per hour. After this permit action, WBI was considered a synthetic minor source from the Title V operating permit program. In addition, the permit was updated to reflect the current format and language. **MAQP #2801-01** was issued on June 15, 2000.

After further review, the Department of Environmental Quality (Department) determined that the Title V synthetic minor language needed in **MAQP #2801-01** was not included in the previous modification. Specifically, a requirement for annual certification of being below the Title V permitting threshold was necessary for those sources classified as Title V synthetic minors. WBI became a synthetic minor source following the issuance of **MAQP #2801-01**. **MAQP #2801-02** addressed the administrative action and replaced **MAQP #2801-01**.

## D. Current Permit Action

On January 10, 2011, the Department received an application for a modification to add two 2,370 brake horsepower (bhp) 4-stroke lean-burn compressor engines equipped with oxidation catalyst. An affidavit of public notice was received on February 1, 2011, and final correspondence completing the application on February 15, 2011. The current action permits the proposed changes, and updates the format and rule references of the permit to reflect that currently used by the Department.

A review of previous permit actions was accomplished to determine the appropriate rule reference and status of the allowable CO emissions reduction accomplished in **MAQP #2801-01**. The permit history lead the reader to believe an ARM 17.8.1204 reference may have been missed in the permitting action of **MAQP 2801-01** or **-02**. The modification action of **MAQP #2801-01** reduced the allowable emissions rate. The action was essentially updating the appropriate emissions factor, correcting the BACT condition, and accepted with the BACT reference in **MAQP #2801-01**. Therefore, no ARM 17.8.1204 reference is appropriate for that CO limit.



## E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

## II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

### A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

WBI shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.
5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

### B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide

7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM<sub>10</sub>

WBI must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, WBI shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.
4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. (4) Commencing July 1, 1972, no person shall burn liquid or solid fuels containing sulfur in excess of 1 pound of sulfur per million Btu fired. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions. WBI will burn pipeline quality natural gas, which will meet this limitation.
6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.
7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). This facility is an NSPS affected source because it meets the definition of any NSPS subpart defined in 40 CFR Part 60.
  - a. 40 CFR 60, Subpart A – General Provisions apply to all equipment or facilities subject to an NSPS Subpart as listed below:

- b. 40 CFR 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. The provisions of this subpart are applicable to owners and operators of stationary spark ignition internal combustion engines (SI ICE) that commence modification or reconstruction after June 12, 2006. Therefore, the two new CAT G3608 LE compressor engines WBI has proposed are subject to this standard.
  - c. 40 CFR 60, Subpart KK – Standards of Performance for Equipment leaks of VOC from Onshore Natural Gas Processing Plants. The provisions of this subpart apply to affected facilities in onshore natural gas processing plants. Natural gas processing plant (gas plant) is defined in this subpart as any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both. Therefore, WBI is not subject to this subpart.
- 8. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This source shall comply with the standards and provisions of 40 CFR Part 61, as appropriate.
- 9. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63, as listed below:
  - a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to an New Emissions Standard for Hazardous Air Pollutants (NESHAP) Subpart as listed below:
  - b. 40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities. This subpart applies to the owners and operators of the emission points, specified in paragraph (b) of this section that are located at oil and natural gas production facilities that meet the specified criteria in paragraphs (a)(1) and either (a)(2) or (a)(3) of this section. WBI's Monarch compressor station does not receive natural gas prior to processing and/or treatment, therefore, this facility is located after a point of custody transfer and is therefore not subject to this subpart.
  - c. 40 CFR 63, Subpart HHH - National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities. This subpart applies to owners and operators of natural gas transmission and storage facilities that transport or store natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company), and that are major sources of hazardous air pollutant (HAP) emissions as defined in 40 CFR 63.1271. WBI is not a major source of HAP emissions; therefore, this subpart does not apply.
  - d. 40 CFR 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE). An owner or operator of a stationary RICE at a major or area source of HAP emissions is subject to this subpart, except if the stationary RICE is being tested at a stationary RICE test cell/stand. Therefore, WBI is subject to this subpart.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.402 Requirements. WBI must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or modified stack for WBI is below the allowable 65-meter GEP stack height.

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an MAQP application fee concurrent with the submittal of an MAQP application. A permit application is incomplete until the proper application fee is paid to the Department. WBI submitted the appropriate permit application fee for the current permit action.
2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an MAQP (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an MAQP application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

F. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an MAQP or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. WBI has a PTE greater than 25 tons per year of oxides of nitrogen (NO<sub>x</sub>), CO, and volatile organic compounds (VOC); therefore, an MAQP is required.
3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the MAQP program.
4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the MAQP Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. WBI submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. WBI submitted an affidavit of publication of public notice for the January 14, 2011, issue of the *Fallon County Times*, a newspaper of general circulation in the Town of Baker in Fallon County, Montana, as proof of compliance with the public notice requirements.
6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.
8. ARM 17.8.755 Inspection of Permit. This rule requires that MAQPs shall be made available for inspection by the Department at the location of the source.
9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving WBI of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.
11. ARM 17.8.762 Duration of Permit. An MAQP shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.
12. ARM 17.8.763 Revocation of Permit. An MAQP may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
13. ARM 17.8.764 Administrative Amendment to Permit. An MAQP may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase

meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an MAQP may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.
2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source because this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant.

H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:
  - a. PTE > 100 tons/year of any pollutant;
  - b. PTE > 10 tons/year of any one hazardous air pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
  - c. PTE > 70 tons/year of particulate matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>) in a serious PM<sub>10</sub> nonattainment area.
2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #2801-03 for WBI, the following conclusions were made:
  - a. The facility's PTE is less than 100 tons/year for any pollutant.
  - b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.
  - c. This source is not located in a serious PM<sub>10</sub> nonattainment area.
  - d. This facility is subject to current NSPS (Subpart JJJJ).

- e. This facility is subject to current NESHAP standards (Subpart ZZZZ).
- f. This source is not a Title IV affected source.
- g. This source is not a solid waste combustion unit.
- h. As allowed by ARM 17.8.1204(3), the Department may exempt a source from the requirement to obtain an air quality operating permit by establishing federally enforceable limitations which limit that source's PTE.
  - i. In applying for an exemption under this section, the owner or operator of the source shall certify to the Department that the source's potential to emit, does not require the source to obtain an air quality operating permit.
  - ii. Any source that obtains a federally enforceable limit on potential to emit shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit.

WBI has taken federally enforceable permit limits to keep potential emissions below major source permitting thresholds. Therefore, the facility is not a major source and, thus a Title V operating permit is not required.

The Department determined that the annual reporting requirements contained in the permit are sufficient to satisfy this requirement.

### 3. ARM 17.8.1207 Certification of Truth, Accuracy, and Completeness.

WBI shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204 (3)(b). The annual certification shall comply with requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emission inventory information.

## III. BACT Determination

A BACT determination is required for each new or modified source. WBI shall install on the new or modified source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by WBI in permit application #2801-03, addressing some available methods of controlling CO and VOC emissions from the 4-stroke lean-burn compressor engines. The Department reviewed these methods, as well as previous BACT determinations. The following has been reviewed by the Department in order to make the BACT determinations:

The primary criteria pollutants from natural gas-fired reciprocating engines are NO<sub>x</sub>, CO, and VOC. CO and VOC are primarily the result of incomplete combustion. Particulate matter (PM) emissions include trace amounts of metals, non-combustible inorganic material, and condensable, semi-volatile organics which result from volatilized lubricating oil, engine wear, or from products of incomplete combustion. Sulfur oxides (SO<sub>x</sub>) are very low since sulfur compounds are removed from natural gas in forming pipeline quality natural gas. However, trace amounts of sulfur containing odorant are added to pipeline quality natural gas for the purpose of leak detection.

Three generic control techniques have been developed for reciprocating engines: parametric controls (timing and operating at a leaner air-to-fuel ratio); combustion modifications such as advanced engine design (clean-burn cylinder head designs and pre-stratified charge combustion for rich-burn

engines); and post combustion catalytic controls installed on the engine exhaust system. Post-combustion catalytic technologies include selective catalytic reduction (SCR) for lean-burn engines, Non-Selective Catalytic Reduction for rich-burn engines, and CO oxidation catalysts for lean-burn engines.

The proposed compressor engine is of a 4-stroke lean-burn engine class. The air to fuel ratios (AFR) of lean-burn engines normally range from 20:1 to 50:1 and are typically higher than 24:1. The exhaust excess oxygen levels of lean-burn engines are typically around 8 percent, typically ranging from 4 to 17 percent. Lean-burn engines naturally produce lower NO<sub>x</sub> emissions than rich-burn engines, and therefore, NO<sub>x</sub> emissions are usually a function of the design of the engine rather than based on effectiveness of control technology.

#### CO BACT:

Because of the stoichiometry of lean-burn engines (relatively high excess oxygen in the exhaust stream), NSCR is not a technically feasible option. NSCR is effectively limited to engines with normal exhaust oxygen levels of 4 percent or less. Furthermore, lean-burn engines cannot be retrofitted with NSCR control because of the reduced exhaust temperatures.

This leaves CO oxidation catalysts as the only technically feasible add on control. In a catalytic oxidation system, CO passes over a catalyst, usually a noble metal, which oxidizes the CO to carbon dioxide (CO<sub>2</sub>) at efficiencies around 90 percent for 4-stroke lean-burn engines. This technology requires the higher excess oxygen content of lean-burn engines to oxidize the CO, and AFR control may be required to optimize the control efficiency of the catalyst.

The Department determined that properly operated and maintained engine, with properly operated and maintained CO oxidation catalyst, constitutes BACT for control of CO emissions, as proposed by WBI. The resulting BACT CO emission limit will be derived from 0.20 grams per brake-horsepower hour (g/bhp-hr), based on the manufacturer's guaranteed control efficiency of 93%.

#### NO<sub>x</sub> BACT:

As discussed, lean-burn engine design results in lower NO<sub>x</sub> emissions. The engine has an emissions rate of 0.50 g/bhp-hr. This emissions rate is similar to that of post NSCR control of rich-burn engines.

As described in the CO BACT analysis, NSCR is a technically infeasible control option for 4-stroke lean-burn engines. This leaves SCR with AFR control, and low NO<sub>x</sub> emissions inherent to the design of the lean-burn engine, as technically feasible control technologies.

An SCR system consists of an ammonia (NH<sub>3</sub>) storage, feed, and injection system, and a catalyst and catalyst housing. SCR systems selectively reduce NO<sub>x</sub> emissions by injecting ammonia (either in the form of liquid anhydrous ammonia or aqueous ammonium hydroxide) into the exhaust gas stream upstream of the catalyst. NO<sub>x</sub>, NH<sub>3</sub>, and oxygen (O<sub>2</sub>) react on the surface of the catalyst to form nitrogen (N<sub>2</sub>) and water (H<sub>2</sub>O).

SCR can achieve efficiencies as high as 90 percent. However, for engines which typically operate at variable loads, such as engines on gas transmission pipelines, an SCR system may not function effectively, causing either periods of ammonia slip or insufficient ammonia to gain the reductions needed. This creates uncertainty in the control efficiency of NO<sub>x</sub>, and adds potential NH<sub>3</sub> emissions from the potential ammonia slip. The Department determined this control technology is not appropriate given the low NO<sub>x</sub> emissions inherent to the design of the engine proposed, as discussed next.



The NO<sub>x</sub> emissions rate from the proposed engine, without add-on controls is 0.50 g/bhp-hr. Therefore, the Department determined that properly operating and maintaining the engine, with the low NO<sub>x</sub> emissions inherent to the design of this engine, with no additional controls, constitutes BACT in this case. The BACT NO<sub>x</sub> emission limit will be 0.50 g/bhp-hr, as proposed by WBL.

VOC BACT:

The Department is not aware of any BACT determinations that have required controls for VOC emissions alone from compressor engines. The uncontrolled PTE of VOC emissions is relatively small and any add-on controls would likely be shown as cost prohibitive.

However, the control technology selected for CO emissions also reduces VOC emissions. The Department determined that proper operation and maintenance of the engine and the control technology, as required by the CO BACT, constitutes as BACT for VOC. The BACT limit will be derived from 0.32 g/bhp-hr, based on the control technology's guarantee of 50% reduction of VOCs.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emissions standards.

#### IV. Emissions Inventory

<b>Williston Basin Interstate Pipeline Company</b> <b>Monarch Compressor Station</b> <b>MAQP #2801-03</b>									
Source	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	CH <sub>2</sub> O	HAPs
2000-hp Superior 12SGTB	0.57	0.57	0.57	35.20	40.00	17.60	0.03	3.00	4.10
2000-hp Superior 12SGTB	0.57	0.57	0.57	35.20	40.00	17.60	0.03	3.00	4.10
2370-hp CAT 3608 LE	0.78	0.78	0.78	11.42	4.57	7.31	0.05	1.03	2.55
2370-hp CAT 3608 LE	0.78	0.78	0.78	11.42	4.57	7.31	0.05	1.03	2.55
248-hp Waukesha F1197G Backup/Emergency Generator	0.01	0.01	0.01	2.73	0.14	0.14	0.00	0.01	0.02
TEG Dehydration Unit Reboiler - 1.5 MMBtu/hr	0.05	0.05	0.05	0.63	0.53	0.03	0.00	0.00	0.02
TEG Dehydration Unit Still Vent						29.71			5.22
Flash Tank (to atmosphere)						4.61			0.03
2.47 MMBtu/hr Boiler (Weil Mclain)	0.08	0.08	0.08	1.03	0.87	0.06	0.01	0.00	0.02
0.063 MMBtu/hr Water Heater (A.O. Smith)	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00
0.075 MMBtu/hr Space Heater (Gordon Ray)	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00
0.075 MMBtu/hr Space Heater (Gordon Ray)	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00
<b>TOTAL:</b>	<b>2.84</b>	<b>2.84</b>	<b>2.84</b>	<b>97.71</b>	<b>90.74</b>	<b>84.37</b>	<b>0.17</b>	<b>8.08</b>	<b>18.60</b>

\*\* Note: Some emissions may show zero due to rounding. See calculations below. The emissions represent allowable emissions based on a requested hours of operation limitation on the 2000-hp Superior 12SGTB engines.

TEG Dehydration Vent and Flash Tank emissions calculated using Gly-Calc Version 4.0 - see application

bhp = brake horsepower  
 Btu = British thermal unit  
 CAT = Caterpillar compressor engine  
 CH<sub>2</sub>O = formaldehyde  
 CO = carbon monoxide  
 g/bhp-hr = grams per brake-horsepower hour  
 HAPs = hazardous air pollutants  
 hp = horsepower  
 hr = hour  
 lb = pound  
 MMBtu = million british thermal units  
 MMscf = million standard cubic feet  
 NO<sub>x</sub> = oxides of nitrogen  
 PM = particulate matter  
 PM<sub>10</sub> = particulate matter with an aerodynamic diameter of 10 microns or less  
 PM<sub>2.5</sub> = particulate matter with an aerodynamic diameter of 2.5 microns or less  
 SO<sub>2</sub> = sulfur dioxide  
 TEG = triethylene glycol  
 VOC = volatile organic compounds  
 yr = year

## Emissions Calculations

### 2000-hp Superior 12SGTB

Hours of Operation:	8000	hr/yr
Maximum rated horsepower:	2000	bhp
Maximum rated heat input:	7100	Btu/hp-hr
	14200000	btu/hr

### NO<sub>x</sub> Emissions

Emissions Factor:	2.00	g/bhp-hr	(Permit Limit of 8.8 lb/hr based on Previous BACT limit)
Calculations:	2g/bhp-hr*2000bhp*0.0022 lb/g =	8.80	lb/hr
	8.8lb/hr*8000hr/yr*0.0005 ton/lb =	35.20	ton/yr

### CO Emissions

Emissions Factor:	10	lb/hr	(Permit Limit from Previous BACT)
Calculations:	10lb/hr*8000hr/yr*0.0005 ton/lb =	40.00	ton/yr

### VOC Emissions

Emissions Factor:	4.4	lb/hr	(Permit Limit from Previous BACT)
Calculations:	4.4lb/hr*8000hr/yr*0.0005 ton/lb =	17.60	ton/yr

### PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions

Filterable Emissions Factor:	0.0000771	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)
Calculations:	0.0000771lb/MMBtu*14200000btu/hr*1/10^6 MMBtu/Btu	0.001	lb/hr
	0.00109482lb/hr*8000hr/yr*0.0005 ton/lb =	0.004	ton/yr

Condensable Emissions Factor:	0.00991	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)
Calculations:	0.00991lb/MMBtu*14200000btu/hr*1/10^6 MMBtu/Btu	0.14	lb/hr
	0.140722lb/hr*8000hr/yr*0.0005 ton/lb =	0.56	ton/yr

TOTAL:		0.14	lb/hr
		0.57	ton/yr

### SO<sub>2</sub> Emissions

Emissions Factor:	0.000588	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)
Calculations:	0.000588lb/MMBtu*14200000btu/hr*1/10^6 MMBtu/Btu	0.01	lb/hr
	0.0083496lb/hr*8000hr/yr*0.0005 ton/lb =	0.03	ton/yr

**HAPS Emissions**

<u>Component</u>	<u>Emissions</u> <u>Factor</u> <u>(lb/MMBtu)</u>
1,1,2,2-Tetrachloroethane	0.00004
1,1,2-Trichloroethane	0.0000318
1,3-Butadiene	0.000267
1,3-Dichloropropene	0.0000264
2,2,4-Trimethylpentane	0.00025
2-Methylnaphthalene	0.0000332
Acenaphthene	0.00000125
Acenaphthylene	0.00000553
Acetaldehyde	0.00836
Acrolein	0.00514
Anthracene	
Benz(a)anthracene	
Benzene	0.00044
Benzo(a)pyrene	
Benzo(b)fluoranthene	0.000000166
Benzo(e)pyrene	0.000000415
Benzo(g,h,i)perylene	0.000000414
Benzo(k)fluoranthene	
Biphenyl	0.000212
Carbon Tetrachloride	0.0000367
Chlorobenzene	0.0000304
Chloroform	0.0000285
Chrysene	0.000000693
Ethylbenzene	0.0000397
Ethylene Dibromide	0.0000443
Fluoranthene	0.00000111
Fluorene	0.00000567
Formaldehyde	0.0528
Indeno(1,2,3-c,d)pyrene	
Methanol	0.0025
Methylene Chloride	0.00002
n-Hexane	0.00111
Naphthalene	0.0000744
PAH	0.0000269
Perylene	
Phenanthrene	0.0000104
Phenol	0.000024
Pyrene	0.00000136
Styrene	0.0000236

Tetrachloroethane	0.00000248
Toluene	0.000408
Vinyl Chloride	0.0000149
Xylene	0.000184
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TOTAL:	0.07

Emissions Factor: 0.07 lb/MMBtu (AP-42 Table 3.2-2, 07/2000)

Calculations:  $0.072195288 \text{ lb/MMBtu} * 14200000 \text{ btu/hr} * 1/10^6 \text{ MMBtu/Btu}$  1.03 lb/hr  
 $1.0251730896 \text{ lb/hr} * 8000 \text{ hr/yr} * 0.0005 \text{ ton/lb} =$  **4.10 ton/yr**

As calculated in application: 4.60 ton/yr

Formaldehyde: 0.05 lb/MMBtu (AP-42 Table 3.2-2, 07/2000)

$0.0528 \text{ lb/MMBtu} * 14200000 \text{ btu/hr} * 1/10^6$   
MMBtu/Btu 0.75 lb/hr  
 $0.74976 \text{ lb/hr} * 8000 \text{ hr/yr} * 0.0005 \text{ ton/lb} =$  **3.00 ton/yr**

#### **2370 bhp Caterpillar 4-stroke lean burn G3608LE**

##### **(4-stroke lean burn)**

Hours of Operation: 8760 hr/yr  
Maximum rated horsepower: 2370 bhp  
Maximum rated heat input: 7539 Btu/hp-hr  
17867430 btu/hr

#### **NO<sub>x</sub> Emissions**

Emission Factor: 0.5 g/bhp-hr (BACT derived Limit)

Calculations:  $0.5 \text{ g/bhp-hr} * 2370 \text{ bhp} * 0.0022 \text{ lb/g} =$  2.61 lb/hr  
 $2.607 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} =$  **11.42 ton/yr**

#### **CO Emissions**

Emissions Factor: 0.2 (BACT Derived Limit)

Calculations:  $0.2 * 2370 \text{ bhp} * 0.0022 \text{ lb/g} =$  1.04 lb/hr  
 $1.0428 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} =$  **4.57 ton/yr**

#### **VOC Emissions**

Emissions Factor: 0.32 g/bhp-hr (BACT derived Limit)

Calculations:  $0.32 \text{ g/bhp-hr} * 2370 \text{ bhp} * 0.0022 \text{ lb/g} =$  1.67 lb/hr  
 $1.66848 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} =$  **7.31 ton/yr**

**PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions**

Filterable Emissions Factor:	0.0000771 lb/MMBtu (AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.0000771lb/MMBtu*17867430btu/hr*10 <sup>-6</sup> MMBtu/Btu =	0.001 lb/hr	
	0.00137757lb/hr*8760hr/yr*0.0005ton/lb =	<b>0.01 ton/yr</b>	
Condensable Emissions Factor:	0.00991 lb/MMBtu (AP-42 Table 3.2-2, 07/2000)	0.18 lb/hr	
Calculations:	0.17706623lb/hr*8760hr/yr*0.0005ton/lb =	<b>0.78 ton/yr</b>	
TOTAL:		<b>0.78 ton/yr</b>	

**SO<sub>2</sub> Emissions**

Emissions Factor:	0.000588 lb/MMBtu (AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.000588lb/MMBtu*17867430btu/hr*10 <sup>-6</sup> MMBtu/Btu =	0.01 lb/hr	
	0.01050604lb/hr*8760hr/yr*0.0005ton/lb =	<b>0.05 ton/yr</b>	

**HAPs Emissions**

<u>Component</u>	<u>Emissions</u> <u>Factor</u> <u>(lb/MMBtu)</u>
1,1,2,2-Tetrachloroethane	0.00004
1,1,2-Trichloroethane	0.0000318
1,3-Butadiene	0.000267
1,3-Dichloropropene	0.0000264
2,2,4-Trimethylpentane	0.00025
2-Methylnaphthalene	0.0000332
Acenaphthene	0.00000125
Acenaphthylene	0.00000553
Acetaldehyde	0.00836
Acrolein	0.00514
Anthracene	
Benz(a)anthracene	
Benzene	0.00044
Benzo(a)pyrene	
Benzo(b)fluoranthene	0.000000166
Benzo(e)pyrene	0.000000415
Benzo(g,h,i)perylene	0.000000414
Benzo(k)fluoranthene	
Biphenyl	0.000212
Carbon Tetrachloride	0.0000367
Chlorobenzene	0.0000304
Chloroform	0.0000285
Chrysene	0.000000693
Ethylbenzene	0.0000397
Ethylene Dibromide	0.0000443

Fluoranthene	0.00000111	
Fluorene	0.00000567	
Formaldehyde	0.0132	(75% reduction by oxidation catalyst)
Indeno(1,2,3-c,d)pyrene		
Methanol	0.0025	
Methylene Chloride	0.00002	
n-Hexane	0.00111	
Naphthalene	0.0000744	
PAH	0.0000269	
Perylene		
Phenanthrene	0.0000104	
Phenol	0.000024	
Pyrene	0.00000136	
Styrene	0.0000236	
Tetrachloroethane	0.00000248	
Toluene	0.000408	
Vinyl Chloride	0.0000149	
Xylene	0.000184	
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TOTAL:	0.03	

Emissions Factor: 0.03 lb/MMBtu (AP-42 Table 3.2-1, 07/2000)

Calculations:  $0.032595288 \text{ lb/MMBtu} * 17867430 \text{ btu/hr} * 10^{-6} \text{ MMBtu/Btu} = 0.58 \text{ lb/hr}$   
 $0.58239402666984 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = \mathbf{2.55 \text{ ton/yr}}$   
 \*\* there is likely reduction of other HAPS from oxidation catalyst, however,  
 no information is available. Therefore, this is expected to be conservative but more correct

As calculated in the application (no oxidation catalyst reductions accounted for): 5.45 ton/yr

Formaldehyde: 0.01 lb/MMBtu (AP-42 Table 3.2-1, 07/2000)

$0.0132 \text{ lb/MMBtu} * 17867430 \text{ btu/hr} * 10^{-6} \text{ MMBtu/Btu} = 0.24 \text{ lb/hr}$   
 $0.235850076 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = \mathbf{1.03 \text{ ton/yr}}$

**248 hp Natural Gas Generator Engine (Emergency generator)**

(4-stroke rich-burn)

Hours of Operation:	500	hr/yr
Maximum rated horsepower:	248	bhp
Maximum rated heat input:	8200	Btu/hp-hr
	2033600	btu/hr

**NO<sub>x</sub> Emissions**

Emissions Factor	20	g/bhp-hr	Previous Manufacturer's Data	
Calculations:	20g/bhp-hr*248bhp*0.0022 lb/g =		10.91	lb/hr
	10.912lb/hr*500hr/yr*0.0005 ton/lb =		<b>2.73</b>	<b>ton/yr</b>

**CO Emissions**

Emissions Factor	1	g/bhp-hr	Previous Manufacturer's Data	
Calculations:	1g/bhp-hr*248bhp*0.0022 lb/g =		0.55	lb/hr
	0.5456lb/hr*500hr/yr*0.0005 ton/lb =		<b>0.14</b>	<b>ton/yr</b>

**VOC Emissions**

Emissions Factor	1	g/bhp-hr	Previous Manufacturer's Data	
Calculations:	1g/bhp-hr*248bhp*0.0022 lb/g =		0.55	lb/hr
	0.5456lb/hr*500hr/yr*0.0005 ton/lb =		<b>0.14</b>	<b>ton/yr</b>

**PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions**

Filterable Emissions Factor	0.0095	lb/MMBtu	(AP-42 Table 3.2-3, 7/2000)	
Calculations:	0.0095lb/MMBtu*2033600btu/hr*10 <sup>-6</sup> MMBtu/Btu =		0.02	lb/hr
	0.0193192lb/hr*500hr/yr*0.0005 ton/lb =		0.0048	ton/yr

Condensable Emissions Factor	0.00991	lb/MMBtu	(AP-42 Table 3.2-3, 7/2000)	
Calculations:	0.00991lb/MMBtu*2033600btu/hr*10 <sup>-6</sup> MMBtu/Btu =		0.02	lb/hr
	0.020152976lb/hr*500hr/yr*0.0005 ton/lb =		0.01	ton/yr

TOTAL:			<b>0.01</b>	<b>ton/yr</b>
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**SO<sub>2</sub> Emissions**

Emissions Factor	0.000588	lb/MMBtu	(AP-42 Table 3.2-3, 7/2000)	
Calculations:	0.000588lb/MMBtu*2033600btu/hr*10 <sup>-6</sup> MMBtu/Btu =		0.001	lb/hr
	0.0011957568lb/hr*500hr/yr*0.0005 ton/lb =		<b>0.0003</b>	<b>ton/yr</b>



## HAPS Emissions

Pollutant	Emissions Factor (lb/MMBtu)
1,1,2,2-Tetrachloroethane	0.0000253
1,1,2-Trichloroethane	0.0000153
1,3-Butadiene	0.000663
1,3-Dichloropropene	0.0000127
Acetaldehyde	0.00279
Acrolein	0.00263
Benzene	0.00158
Carbon Tetrachloride	0.0000177
Chlorobenzene	0.0000129
Chloroform	0.0000137
Ethylbenzene	0.0000248
Ethylene Dibromide	0.0000213
Formaldehyde	0.0205
Methanol	0.00306
Methylene Chloride	0.0000412
Naphthalene	0.0000971
PAH	0.000141
Styrene	0.0000119
Toluene	0.000558
Vinyl Chloride	0.00000718
Xylene	0.000195
TOTAL:	0.03241808

Emissions Factor 0.03241808 lb/MMBtu (AP-42 Table 3.2-3, 7/2000)

Calculations:  $0.03241808 \text{ lb/MMBtu} \times 2033600 \text{ btu/hr} \times 10^{-6} \text{ MMBtu/Btu} = 0.07 \text{ lb/hr}$   
 $0.065925407488 \text{ lb/hr} \times 500 \text{ hr/yr} \times 0.0005 \text{ ton/lb} = 0.016 \text{ ton/yr}$

Formaldehyde:

Emissions Factor 0.0205 lb/MMBtu (AP-42 Table 3.2-3, 7/2000)

Calculations:  $0.0205 \text{ lb/MMBtu} \times 2033600 \text{ btu/hr} \times 10^{-6} \text{ MMBtu/Btu} = 0.04 \text{ lb/hr}$   
 $0.0416888 \text{ lb/hr} \times 500 \text{ hr/yr} \times 0.0005 \text{ ton/lb} = 0.010 \text{ ton/yr}$

### TEG Dehydration Unit Reboiler

Maximum Rated Capacity:	1.5	MMBtu/hr	
Hours of Operation:	8760	hr/yr	
Gas Heat Content:	1050	btu/scf	(MAQP 2801-03 Application)
	0.00142857	MMscf/hr	(calculated)

### **PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions**

		(AP-42 Table 1.4-	
Filterable Emissions Factor:	1.9	lb/MMscf	2, 07/1998)
Calculations:	1.9lb/MMscf*0.00142857MMscf/hr=	0.0027143	lb/hr
	0.0027142lb/hr*8760hr/yr*0.0005 ton/lb =	0.01	ton/yr
		(AP-42 Table	
Condensable Emissions Factor:	5.7	lb/MMscf	1.4-2, 07/1998)
Calculations:	5.7lb/MMscf*0.00142857MMscf/hr=	0.0081429	lb/hr
	0.0081428lb/hr*8760hr/yr*0.0005 ton/lb =	0.04	ton/yr
TOTAL:		<b>0.05</b>	<b>ton/yr</b>

### **NO<sub>x</sub> Emissions:**

		(AP-42 Table 1.4-	
Emissions Factor:	100	lb/MMscf	1, 07/1998)
Calculations:	100lb/MMscf*0.00142857MMscf/hr=	0.1428571	lb/hr
	0.1428571lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.63</b>	<b>ton/yr</b>

### **CO Emissions:**

		(AP-42 Table 1.4-	
Emissions Factor:	84	lb/MMscf	1, 07/1998)
Calculations:	84lb/MMscf*0.00142857MMscf/hr=	0.12	lb/hr
	0.12lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.53</b>	<b>ton/yr</b>

### **VOC Emissions:**

		(AP-42 Table 1.4-	
Emissions Factor:	5.5	lb/MMscf	1, 07/1998)
Calculations:	5.5lb/MMscf*0.00142857MMscf/hr=	0.0078571	lb/hr
	0.0078571lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.03</b>	<b>ton/yr</b>

### **SO<sub>2</sub> Emissions:**

		(AP-42 Table 1.4-	
Emissions Factor:	0.6	lb/MMscf	1, 07/1998)

Calculations:	0.6lb/MMscf*0.00142857MMscf/hr=	0.0008571 lb/hr
	0.00085714lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.004 ton/yr</b>

#### HAPs Emissions:

Pollutant	Emissions Factor (lb/MMscf)
2-Methylnaphthalene	2.40E-05
3-Methylchloranthrene	1.80E-06
7,12-Dimethylbenz(a)anthracene	1.60E-05
Acenaphthene	1.80E-06
Acenaphthylene	1.80E-06
Anthracene	2.40E-06
Benz(a)anthracene	1.80E-06
Benzene	2.10E-03
Benzo(a)pyrene	1.20E-06
Benzo(b)fluoranthene	1.80E-06
Benzo(g,h,i)perylene	1.20E-06
Benzo(k)fluoranthene	1.80E-06
Chrysene	1.80E-06
Dibenzo(a,h)anthracene	1.20E-06
Dichlorobenzene	1.20E-03
Fluoranthene	3.00E-06
Fluorene	2.80E-06
Formaldehyde	7.50E-02
Hexane	1.80E+00
Indeno(1,2,3-cd)pyrene	1.80E-06
Naphthalene	6.10E-04
Phenanthrene	1.70E-05
Pyrene	5.00E-06
Toluene	3.40E-03
Arsenic	2.00E-04
Beryllium	1.20E-05
Cadmium	1.10E-03
Chromium	1.40E-03
Cobalt	8.40E-05
Manganese	3.80E-04
Mercury	2.60E-04
Nickel	2.10E-03
Selenium	2.40E-05
TOTAL:	1.89E+00

Emissions Factor:	1.89E+00 lb/MMscf
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Calculations:	$1.89\text{lb/MMscf} \times 0.00142857142857143\text{MMscf/hr} =$	0.0027	lb/hr
	$0.0027\text{lb/hr} \times 8760\text{hr/yr} \times 0.0005\text{ ton/lb} =$	<b>0.012</b>	<b>ton/yr</b>

As submitted in application calculations:		<b>0.017</b>	<b>ton/yr</b>
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Formaldehyde	7.50E-02 lb/MMscf		
	$0.075\text{lb/MMscf} \times 0.00142857142857143\text{MMscf/hr} =$	0.0001071	lb/hr
	$0.000107142857142857\text{lb/hr} \times 8760\text{hr/yr} \times 0.0005\text{ ton/lb} =$	<b>0.0005</b>	<b>ton/yr</b>

#### **2.47 MMBtu/HR WM Boiler**

Hours of Operation:	8760 hr/yr
Heat Input:	2.47 MMBtu/hr
NG Heat Content:	1050 btu/scf
	0.00235238 MMscf/hr

#### **PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions**

Filterable Emissions Factor:	1.9 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	$1.9\text{lb/MMscf} \times 0.00235238095238095\text{MMscf/hr} =$	0.00447	lb/hr
	$0.00446952380952381\text{lb/hr} \times 8760\text{hr/yr} \times 0.0005\text{ ton/lb} =$	0.020	ton/yr

Condensable Emissions Factor:	5.7 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	$5.7\text{lb/MMscf} \times 0.00235238095238095\text{MMscf/hr} =$	0.013409	lb/hr
	$0.0134085714285714\text{lb/hr} \times 8760\text{hr/yr} \times 0.0005\text{ ton/lb} =$	0.059	ton/yr

TOTAL:		<b>0.08</b>	<b>ton/yr</b>
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#### **NO<sub>x</sub> Emissions:**

Emissions Factor:	100 lb/MMscf (AP-42 Table 1.4-1, 07/1998)		
Calculations:	$100\text{lb/MMscf} \times 0.00235238095238095\text{MMscf/hr} =$	0.235238	lb/hr
	$0.235238095238095\text{lb/hr} \times 8760\text{hr/yr} \times 0.0005\text{ ton/lb} =$	<b>1.03</b>	<b>ton/yr</b>

#### **CO Emissions:**

Emissions Factor:	84 lb/MMscf (AP-42 Table 1.4-1, 07/1998)		
Calculations:	$84\text{lb/MMscf} \times 0.00235238095238095\text{MMscf/hr} =$	0.1976	lb/hr
	$0.1976\text{lb/hr} \times 8760\text{hr/yr} \times 0.0005\text{ ton/lb} =$	<b>0.87</b>	<b>ton/yr</b>

#### **VOC Emissions:**

Emissions Factor:	5.5 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	$5.5\text{lb/MMscf} \times 0.00235238095238095\text{MMscf/hr} =$	0.012938	lb/hr
	$0.0129380952380952\text{lb/hr} \times 8760\text{hr/yr} \times 0.0005\text{ ton/lb} =$	<b>0.06</b>	<b>ton/yr</b>

**SO<sub>2</sub> Emissions:**

Emissions Factor: 0.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)

Calculations: 0.6lb/MMscf\*0.00235238095238095MMscf/hr= 0.001411 lb/hr

0.00141142857142857lb/hr\*8760hr/yr\*0.0005 ton/lb = **0.01 ton/yr**

**HAPs Emissions:**

Pollutant	Emissions Factor (lb/MMscf)
2-Methylnaphthalene	2.40E-05
3-Methylchloranthrene	1.80E-06
7,12-Dimethylbenz(a)anthracene	1.60E-05
Acenaphthene	1.80E-06
Acenaphthylene	1.80E-06
Anthracene	2.40E-06
Benz(a)anthracene	1.80E-06
Benzene	2.10E-03
Benzo(a)pyrene	1.20E-06
Benzo(b)fluoranthene	1.80E-06
Benzo(g,h,i)perylene	1.20E-06
Benzo(k)fluoranthene	1.80E-06
Chrysene	1.80E-06
Dibenzo(a,h)anthracene	1.20E-06
Dichlorobenzene	1.20E-03
Fluoranthene	3.00E-06
Fluorene	2.80E-06
Formaldehyde	7.50E-02
Hexane	1.80E+00
Indeno(1,2,3-cd)pyrene	1.80E-06
Naphthalene	6.10E-04
Phenanthrene	1.70E-05
Pyrene	5.00E-06
Toluene	3.40E-03
Arsenic	2.00E-04
Beryllium	1.20E-05
Cadmium	1.10E-03
Chromium	1.40E-03
Cobalt	8.40E-05
Manganese	3.80E-04
Mercury	2.60E-04
Nickel	2.10E-03
Selenium	2.40E-05
TOTAL:	1.89E+00

Emissions Factor:	1.89E+00 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
Calculations:	1.8879582lb/MMscf*0.00235238095238095MMscf/hr=	0.004441 lb/hr
	0.00444119690857143lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.02 ton/yr</b>

Formaldehyde:	7.50E-02 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
	0.075lb/MMscf*0.00235238095238095MMscf/hr=	0.000176 lb/hr
	0.000176428571428571lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.001 ton/yr</b>

#### **0.063 MMBtu/hr Water Heater**

Hours of Operation:	8760 hr/yr
Heat Input:	0.063 MMBtu/hr
NG Heat Content:	1050 btu/scf
	0.00006 MMscf/hr

#### **PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions**

Filterable Emissions Factor:	1.9 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
Calculations:	1.9lb/MMscf*0.00006MMscf/hr=	0.000114 lb/hr
	0.000114lb/hr*8760hr/yr*0.0005 ton/lb =	0.000 ton/yr

Condensable Emissions Factor:	5.7 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
Calculations:	5.7lb/MMscf*0.00006MMscf/hr=	0.000342 lb/hr
	0.000342lb/hr*8760hr/yr*0.0005 ton/lb =	0.001 ton/yr

TOTAL:		<b>0.002 ton/yr</b>
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#### **NO<sub>x</sub> Emissions:**

Emissions Factor:	100 lb/MMscf (AP-42 Table 1.4-1, 07/1998)	
Calculations:	100lb/MMscf*0.00006MMscf/hr=	0.006 lb/hr
	0.006lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.03 ton/yr</b>

#### **CO Emissions:**

Emissions Factor:	84 lb/MMscf (AP-42 Table 1.4-1, 07/1998)	
Calculations:	84lb/MMscf*0.00006MMscf/hr=	0.00504 lb/hr
	0.00504lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.02 ton/yr</b>

#### **VOC Emissions:**

Emissions Factor:	5.5 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
Calculations:	5.5lb/MMscf*0.00006MMscf/hr=	0.00033 lb/hr
	0.00033lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.001 ton/yr</b>

**SO<sub>2</sub> Emissions:**

Emissions Factor:	0.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
Calculations:	0.6lb/MMscf*0.00006MMscf/hr=	0.000036 lb/hr
	0.000036lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.0002 ton/yr</b>

**HAPs Emissions:**

Pollutant	Emissions Factor (lb/MMscf)
2-Methylnaphthalene	2.40E-05
3-Methylchloranthrene	1.80E-06
7,12-Dimethylbenz(a)anthracene	1.60E-05
Acenaphthene	1.80E-06
Acenaphthylene	1.80E-06
Anthracene	2.40E-06
Benz(a)anthracene	1.80E-06
Benzene	2.10E-03
Benzo(a)pyrene	1.20E-06
Benzo(b)fluoranthene	1.80E-06
Benzo(g,h,i)perylene	1.20E-06
Benzo(k)fluoranthene	1.80E-06
Chrysene	1.80E-06
Dibenzo(a,h)anthracene	1.20E-06
Dichlorobenzene	1.20E-03
Fluoranthene	3.00E-06
Fluorene	2.80E-06
Formaldehyde	7.50E-02
Hexane	1.80E+00
Indeno(1,2,3-cd)pyrene	1.80E-06
Naphthalene	6.10E-04
Phenanthrene	1.70E-05
Pyrene	5.00E-06
Toluene	3.40E-03
Arsenic	2.00E-04
Beryllium	1.20E-05
Cadmium	1.10E-03
Chromium	1.40E-03
Cobalt	8.40E-05
Manganese	3.80E-04
Mercury	2.60E-04
Nickel	2.10E-03
Selenium	2.40E-05
TOTAL:	1.89E+00

Emissions Factor:	1.89E+00 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
Calculations:	1.8879582lb/MMscf*0.00006MMscf/hr=	0.000113 lb/hr
	0.000113277492lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.0005 ton/yr</b>

Formaldehyde:	7.50E-02 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
	0.075lb/MMscf*0.00006MMscf/hr=	4.5E-06 lb/hr
	0.0000045lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.00002 ton/yr</b>

#### **0.063 MMBtu/hr Water Heater**

Hours of Operation:	8760 hr/yr
Heat Input:	0.075 MMBtu/hr
NG Heat Content:	1050 btu/scf
	7.1429E-05 MMscf/hr

#### **PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions**

Filterable Emissions Factor:	1.9 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
Calculations:	1.9lb/MMscf*7.14285714285714E-05MMscf/hr=	0.000136 lb/hr
	0.000135714285714286lb/hr*8760hr/yr*0.0005 ton/lb =	0.001 ton/yr

Condensable Emissions Factor:	5.7 lb/MMscf (AP-42 Table 1.4-2, 07/1998)	
Calculations:	5.7lb/MMscf*7.14285714285714E-05MMscf/hr=	0.000407 lb/hr
	0.000407142857142857lb/hr*8760hr/yr*0.0005 ton/lb =	0.002 ton/yr

TOTAL:		<b>0.002 ton/yr</b>
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#### **NO<sub>x</sub> Emissions:**

Emissions Factor:	100 lb/MMscf (AP-42 Table 1.4-1, 07/1998)	
Calculations:	100lb/MMscf*7.14285714285714E-05MMscf/hr=	0.007143 lb/hr
	0.00714285714285714lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.03 ton/yr</b>

#### **CO Emissions:**

Emissions Factor:	84 lb/MMscf (AP-42 Table 1.4-1, 07/1998)	
Calculations:	84lb/MMscf*7.14285714285714E-05MMscf/hr=	0.006 lb/hr
	0.006lb/hr*8760hr/yr*0.0005 ton/lb =	<b>0.03 ton/yr</b>



### VOC Emissions:

Emissions Factor: 5.5 lb/MMscf (AP-42 Table 1.4-2, 07/1998)  
Calculations:  $5.5 \text{ lb/MMscf} * 7.14285714285714 \text{E-05 MMscf/hr} = 0.000393 \text{ lb/hr}$   
 $0.000392857142857143 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = \mathbf{0.002 \text{ ton/yr}}$

### SO<sub>2</sub> Emissions:

Emissions Factor: 0.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)  
Calculations:  $0.6 \text{ lb/MMscf} * 7.14285714285714 \text{E-05 MMscf/hr} = 4.29 \text{E-05 lb/hr}$   
 $4.28571428571428 \text{E-05 lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = \mathbf{0.0002 \text{ ton/yr}}$

### HAPs Emissions:

Pollutant	Emissions Factor (lb/MMscf)
2-Methylnaphthalene	2.40E-05
3-Methylchloranthrene	1.80E-06
7,12-Dimethylbenz(a)anthracene	1.60E-05
Acenaphthene	1.80E-06
Acenaphthylene	1.80E-06
Anthracene	2.40E-06
Benz(a)anthracene	1.80E-06
Benzene	2.10E-03
Benzo(a)pyrene	1.20E-06
Benzo(b)fluoranthene	1.80E-06
Benzo(g,h,i)perylene	1.20E-06
Benzo(k)fluoranthene	1.80E-06
Chrysene	1.80E-06
Dibenzo(a,h)anthracene	1.20E-06
Dichlorobenzene	1.20E-03
Fluoranthene	3.00E-06
Fluorene	2.80E-06
Formaldehyde	7.50E-02
Hexane	1.80E+00
Indeno(1,2,3-cd)pyrene	1.80E-06
Naphthalene	6.10E-04
Phenanthrene	1.70E-05
Pyrene	5.00E-06
Toluene	3.40E-03
Arsenic	2.00E-04
Beryllium	1.20E-05
Cadmium	1.10E-03
Chromium	1.40E-03

Cobalt	8.40E-05
Manganese	3.80E-04
Mercury	2.60E-04
Nickel	2.10E-03
Selenium	2.40E-05
TOTAL:	1.89E+00

Emissions Factor: 1.89E+00 lb/MMscf (AP-42 Table 1.4-2, 07/1998)

Calculations:  $1.8879582 \text{ lb/MMscf} * 7.14285714285714 \text{E-05 MMscf/hr} = 0.000135 \text{ lb/hr}$

$0.000134854157142857 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = \mathbf{0.0006 \text{ ton/yr}}$

Formaldehyde: 7.50E-02 lb/MMscf (AP-42 Table 1.4-2, 07/1998)

$0.075 \text{ lb/MMscf} * 7.14285714285714 \text{E-05 MMscf/hr} = 5.36 \text{E-06 lb/hr}$

$5.35714285714286 \text{E-06 lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = \mathbf{0.00002 \text{ ton/yr}}$

## V. Existing Air Quality

The area of the Monarch compressor station is designated as attainment/unclassifiable for all criteria pollutants.

## VI. Ambient Air Impact Analysis

The Department determined, based on ambient air modeling and Department guidance, that the impacts from this permitting action will be minor. The Department believes it will not cause or contribute to a violation of any ambient air quality standard.

## VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	NO	
XX		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	XX	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	XX	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	XX	4. Does the action deprive the owner of all economically viable uses of the property?
	XX	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	XX	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	XX	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	XX	7a. Is the impact of government action direct, peculiar, and significant?
	XX	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	XX	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	XX	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

## VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

**DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**Permitting and Compliance Division**  
**Air Resources Management Bureau**  
**P.O. Box 200901, Helena, Montana 59620**  
**(406) 444-3490**

**FINAL ENVIRONMENTAL ASSESSMENT (EA)**

*Issued To:* Williston Basin Interstate  
Pipeline Company  
Glendive, MT 59330  
P.O. Box 131

*Montana Air Quality Permit Number:* 2801-03

*Preliminary Determination Issued:* 3/1/2011

*Department Decision Issued:* 4/1/2011

*Permit Final:*

1. *Legal Description of Site:* Northeast ¼ of Section 36, Township 9 North, Range 58 East, Fallon County, Montana
2. *Description of Project:* WBI is proposing to add two new 2,370-bhp compressor engines.
3. *Objectives of Project:* The objective of the project is to increase the compression capacity of the natural gas compressor station. The expected construction start date is mid 2011 with an expected start-up date of mid 2012.
4. *Alternatives Considered:* In addition to the proposed action, the Department also considered the “no-action” alternative. The “no-action” alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the “no-action” alternative to be appropriate because WBI demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the “no-action” alternative was eliminated from further consideration.
5. *A Listing of Mitigation, Stipulations, and Other Controls:* A list of enforceable conditions, including a BACT analysis, would be included in MAQP #2801-03.
6. *Regulatory Effects on Private Property:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			XX			Yes
B	Water Quality, Quantity, and Distribution			XX			Yes
C	Geology and Soil Quality, Stability and Moisture			XX			Yes
D	Vegetation Cover, Quantity, and Quality			XX			Yes
E	Aesthetics			XX			Yes
F	Air Quality			XX			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			XX			Yes
H	Demands on Environmental Resource of Water, Air and Energy			XX			Yes
I	Historical and Archaeological Sites			XX			Yes
J	Cumulative and Secondary Impacts			XX			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

MAQP #2801-03 would permit an increase in emissions of all criteria pollutants at an existing site. Allowable emissions would be limited based on conditions and limitations in the MAQP, which would require the appropriate control technology to minimize emissions. Minor effects would be expected to terrestrial and aquatic life and habitats.

B. Water Quality, Quantity and Distribution

MAQP #2801-03 would permit an increase in emissions of all criteria pollutants at an existing site. Allowable emissions would be limited based on conditions and limitations in the MAQP, including requiring the appropriate control technology to minimize emissions. Unaltered hydrostatic test water may be discharged on-site. Application of water on roads and unpaved areas may be required for dust control, and additional water may be required for dust suppression during installation of equipment. Minor effects to water quality, quantity, and distribution would be expected.

C. Geology and Soil Quality, Stability and Moisture

Application of water on roads and unpaved areas may be required for dust control, and additional water may be required for dust suppression during installation of equipment. Less than one acre of land would be disturbed. The Department would not expect any more than a minor effect to geology and soil quality, stability, and moisture.

D. Vegetation Cover, Quantity, and Quality

The project would increase emissions of all criteria pollutants, including particulate matter. However, MAQP #2801-03 would contain limitations and conditions to limit the potential emissions, including requiring control of fugitive dust emissions and appropriate control equipment on the compressor engines. The Department would expect no more than minor effects to vegetation cover, quantity, and quality.

E. Aesthetics

This project would add two compressor engines, and the associated building, piping, and etc. The project would occur at an existing site. A temporary increase in general construction type activity would be present during installation of the engines and associated equipment. Construction related noise impacts would be temporary and limited to daytime hours. As an existing source, the effect of the new sources on the existing noise level would be expected to be minor. Less than one acre would be expected to be disturbed. Minor effects to aesthetics would be expected in issuing MAQP #2801-03.

F. Air Quality

MAQP #2801-03 would contain limitations and conditions to protect effects to air quality. Minor effects to air quality for all criteria pollutants would be expected.

G. Unique Endangered, Fragile, or Limited Environmental Resources

To identify any species of special concern in the immediate area of the proposed project, the Department previously contacted the Montana Natural Heritage Program, Natural Resource Information System (NRIS). NRIS identified the Greater Sage-Grouse as a species of special concern in the area of the proposed facility.

Because this permitting action would permit the addition of two compressor engines and associated equipment within the existing property boundaries of the facility, and the permit would contain limitations and conditions to limit the potential emissions from the facility, the Department would expect no more than a minor effect to the Greater Sage-Grouse.

H. Demands on Environmental Resource of Water, Air and Energy

The project would place very minor demands on air, water, and energy in order to provide compression to facilitate the transportation of natural gas in the natural gas pipeline. Minor effects would be expected on resources of water, air, and energy.

I. Historical and Archaeological Sites

MAQP #2801-03 would permit the addition of two compressor engines on an already developed, privately owned compressor station site. Therefore, the Department would not expect any effects to any historical or archeological sites located on the property. Furthermore, the limitations and conditions of MAQP #2801-03 would limit the allowable emissions of air pollutants which may affect any surrounding historical or archaeological sites. Therefore, the Department determined there would be minor impacts, if any, to historical and archaeological sites.

## J. Cumulative and Secondary Impacts

The Department determined minor impacts to the individual physical and biological considerations above. Collectively, the Department determined that the cumulative and secondary impacts are expected to be minor.

8. *The following table summarizes the potential economic and social effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores			XX			Yes
B	Cultural Uniqueness and Diversity			XX			Yes
C	Local and State Tax Base and Tax Revenue			XX			Yes
D	Agricultural or Industrial Production			XX			Yes
E	Human Health			XX			Yes
F	Access to and Quality of Recreational and Wilderness Activities			XX			Yes
G	Quantity and Distribution of Employment			XX			Yes
H	Distribution of Population			XX			Yes
I	Demands for Government Services			XX			Yes
J	Industrial and Commercial Activity			XX			Yes
K	Locally Adopted Environmental Plans and Goals			XX			Yes
L	Cumulative and Secondary Impacts			XX			Yes

**SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS:** The following comments have been prepared by the Department.

- A. Social Structures and Mores
- B. Cultural Uniqueness and Diversity

No increase or decrease in the number of employees is expected as a result of this project. The project would take place at an existing site. Therefore, the Department would expect minor, if any, impacts to social structures and mores or cultural uniqueness and diversity

- C. Local and State Tax Base and Tax Revenue

An increase in the compression capacity of the facility would result if the proposed project is completed. No increase or decrease in the number of employees would be expected. Minor effects to local and state tax base and tax revenue would be expected as a result of issuing MAQP #2801-03.

- D. Agricultural or Industrial Production

The project would take place within the boundaries of an existing privately owned site. The surrounding area is primarily oil and gas development and livestock grazing grounds. An increase in the potential natural gas compression capabilities of the facility would be expected to occur. Minor effects to agricultural and industrial production would be expected to occur.

E. Human Health

The conditions and limitations of MAQP #2801-03 would be derived from rules designed to protect human health. Therefore, minor effects to human health would be expected to occur in issuing MAQP #2801-03.

F. Access to and Quality of Recreational and Wilderness Activities

The project would take place within the boundaries of an existing privately owned site. The surrounding area is primarily oil and gas development and livestock grazing grounds. An increase in industrial activity associated with construction of the project would be temporary. The Department would expect minor, if any, effects to the quality of recreational and wilderness activities.

G. Quantity and Distribution of Employment

H. Distribution of Population

No increase or decrease in the number of employees associated with the site would be expected to occur for this project. Construction related activity would be temporary. Therefore, the Department would expect that effects to the quantity and distribution of employment and the distribution of population would be minor, if any.

I. Demands for Government Services

Minor effects to demands for government services would be expected as a result of issuing MAQP #2801-03 with associated permit and compliance activities.

J. Industrial and Commercial Activity

The project would take place within the boundaries of an existing privately owned site. The surrounding area is primarily oil and gas development and livestock grazing grounds. An increase in activity associated with construction of the project would be temporary. Therefore, the Department determined there would be minor impacts to industrial or commercial activity in the area.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans and goals that would be affected in issuing MAQP #2901-03. The MAQP is derived from rules designed to protect public health.

L. Cumulative and Secondary Impacts

The Department determined that impacts to the individual economic and social aspects of issuing MAQP #2801-03 would be expected to be minor. Collectively, the Department determined the cumulative and secondary impacts would be expected to be minor.



Recommendation: No Environmental Impact Statement (EIS) is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis:

The current permitting action is for the construction and operation of additional natural gas compressor engines at an existing site. MAQP #2801-03 includes conditions and limitations to limit the potential air pollutant emissions from the facility. In addition, there are no significant impacts determined associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction:

Natural Resource Information System – Montana Natural Heritage Program

Individuals or groups contributing to this EA:

Department of Environmental Quality – Air Resources Management Bureau  
Natural Resource Information System – Montana Natural Heritage Program

EA prepared by: Shawn Juers

Date: 2/15/2011